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EXAMINER	
TESLOVICH, TAMARA	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/854,408
Filing Date: May 10, 2001
Appellant(s): BRUNDAGE, TRENT J.

MAILED

AUG 24 2006

Technology Center 2100

Steven W. Stewart, Registration No. 45,133
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed January 3, 2006 appealing from the final Office action mailed July 1, 2005 and the October 12, 2005 Advisory Action.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

NEW GROUND(S) OF REJECTION

In response to the Applicant's after final addition of "orientation date" and "said controller controlling positioning or movement of an item including the digital watermark" to claim 12, the Examiner finds it necessary to reject claims 12-16 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,113,445 to Wang in view of U.S. Patent No. 5,862,260 to Rhoads, and further in view of U.S. Patent No. 6,282,528 to Schaffer.

Although the abovementioned 103 rejections to claims 12-16 in view of Wang, Rhoads and Schaffer are newly presented, they are a direct result of the after final amendments made to claim 12 wherein the Applicant has added limitations similar to those of claim 17, and are rejected accordingly without raising any new issues.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

U.S. Patent 5,113,445 to Ynjiun Wang

U.S. Patent 5,862,260 to Geoffrey B. Rhoads

U.S. Patent 6,282,528 B1 to J. David Schaffer and Murali Mani

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Wang*, U.S. Patent 5,113,445 and further in view of *Rhoads*, U.S. Patent 5,862,260.

Claim 21 refers to a robot for handling items, said robot comprising: an image sensor for sensing image data of an item including a machine-readable code provided on a surface thereof wherein the machine-readable code comprises an orientation component; electronic processing circuitry; and memory including instruction stored therein for execution by the electronic processing circuitry, the instructions including instruction to: analyze image data captured by the image senor, determine from analyzed image data an orientation of the item relative to the orientation component, and provide position information based on a determined orientation of the item.

Wang refers to a system for encoding data in a machine-readable graphic image form having an increased capacity for encoded information (col.2 lines 3-7) which is then transferred onto a data carrier means (e.g. the surface of a machine part) (col.2 lines 23-26). Wang's system further comprises recognition means for sensing and converting the image into electrical signals representative of the graphic indicia and means for decoding the signals into output signals (col.2 lines 50-55) to be used in a variety of systems, including that of controlling a robotic system (col.4 lines 64-67; col.6 lines 6-15).

Wang fails to teach wherein 'machine-readable graphic image' is comprised of a machine-readable code

Rhoads describes the marking of items, either through an innocuous carrier (e.g. a photograph associated with the product), or by encoding the microtopology of the merchandise's surface or a label thereon for use in systems where the generally used barcodes and universal product codes may be undesirable (col.94 lines 55-63).

Rhoad's solution includes the use of watermarks embedded using image processing software such as Adobe (col.90 lines 54-66) comprising grid signals for orientation purposes as well as a plurality of other information to be used by a variety of systems (col.72 lines 43-59). Rhoads goes on to describe how many industries (e.g. automobile and airlines), stenographically mark industrial parts to provide inconspicuous identification and authentication tags instead of relying on paper tags that can easily be removed and counterfeited (col.95 lines 6-11).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include within Wang the machine readable code as described in Rhoads to allow for an increase in the amount of data encoded onto the label that can be quickly and easily decoded and used to control the orientation, rotation, and translation of said parts.

As per **claim 22**, the combined system of Wang and Rhoads discloses the robot of claim 21, wherein the item includes redundant instances of machine-readable code provided on the surface (see Rhoads col.91 lines 52-55).

As per **claim 23**, the combined system of Wang and Rhoads discloses the robot of claim 21, wherein the position information comprises at least one of an angular rotation and relative distance (see Rhoads col.72 lines 43-59).

As per **claim 24**, the combined system of Wang and Rhoads discloses the robot of claim 21, wherein the machine-readable code comprises stenographic encoding (see Rhoads col.95 lines 6-11).

As per **claim 25**, the combined system of Wang and Rhoads discloses the robot of claim 21, wherein the machine-readable code comprises digital watermarking (see Rhoads col.90 lines 54-66).

As per **claim 26**, the combined system of Wang and Rhoads discloses the method of claim 17, wherein the stenographic encoding comprises digital watermarking (see Rhoads col.90 lines 54-66).

Claims 1-11, 12-16, 17-20 and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Wang*, U.S. Patent 5,113,445, further in view of *Rhoads*, U.S. Patent 5,862,260, and further in view of *Schaffer* et al., U.S. Patent 6,282,528 B1.

Claim 1 refers to a method for controlling placement of a first part on a second part comprising placing a printed image containing a digital watermark on at least one of said parts, capturing a digital image of said printed image, reading a grid signal contained in said digital watermark, and determining the angular rotation of at least one of said parts from said grid signal.

Wang refers to a method for encoding data in a machine-readable graphic image form having an increased capacity for encoded information (col.2 lines 3-7), which is then transferred onto a data carrier means (e.g. the surface of a machine part) (col.2 lines 23-26). Wang's system further comprises recognition means for converting the image into electrical signals representative of the graphic indicia and means for decoding the signals into output signals (col.2 lines 50-55) to be used in a variety of systems, including that of a robotic system (col.4 lines 64-67; col.6 lines 6-15).

Wang fails to teach the placement of a first part on a second part wherein the first part contains a 'machine-readable graphic image' comprised of a digital watermark and wherein the data contained therein is used to determine the angular rotation of at least one of the parts.

Rhoads describes the marking of items, either through an innocuous carrier (e.g. a photograph associated with the product), or by encoding the microtopology of the merchandise's surface or a label thereon for use in systems where the generally used barcodes and universal product codes may be undesirable (col.94 lines 55-63). Rhoad's solution includes the use of watermarks embedded using image processing software such as Adobe (col.90 lines 54-66) comprising grid signals for orientation purposes as well as a plurality of other information to be used by a variety of systems (col.72 lines 43-59). Rhoads goes on to describe how many industries (e.g. automobile and airlines), stenographically mark industrial parts to provide inconspicuous identification and authentication tags instead of relying on paper tags that can easily be removed and counterfeited (col.95 lines 6-11).

Schaffer teaches a method for controlling placement of a first part on a second part using a vision alignment system to improve placement accuracy of the first part (electronic component) on the second part (PCB) including the necessary means to calculate possible deviations such as rotation and translation of said first part with respect to said second part (col.2 lines 45-49; col.6 lines 33-3).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include within Wang the digital watermarks as described in Rhoads to allow for an increase in the amount of data encoded onto the label that can be quickly and easily decoded and used to control the rotation and translation of the first part onto the second part described within Schaffer to align parts properly.

As per **claim 2**, the combined system of Wang, Rhoads and Schaffer discloses the method of claim 1 including reading other payload data from said digital watermark (see Wang col.6 lines 6-11).

As per **claim 3**, the combined system of Wang, Rhoads and Schaffer discloses the method of claim 1 wherein said grid signal is used to determine the location of at least one of said parts (see Schaffer col.2 lines 45-49; col.6 lines 33-3).

As per **claims 4 and 5**, the combined system of Wang, Rhoads and Schaffer discloses the method recited in claim 1 wherein said first part is an electronic

component and wherein said second part is a printed circuit board (see Schaffer col.2 lines 45-49).

Claim 6 refers to a system for controlling a pick and placement machine which places a first part on a second part and wherein at least one of said parts includes a digital watermark, said system comprising

means for reading data from said digital watermark from said part, and

means for determining the orientation of said at least one of said parts from the data read from said digital watermark.

Wang refers to a method for encoding data in a machine-readable graphic image form having an increased capacity for encoded information (col.2 lines 3-7), which is then transferred onto a data carrier means (e.g. the surface of a machine part) (col.2 lines 23-26). Wang's system further comprises recognition means for converting the image into electrical signals representative of the graphic indicia and means for decoding the signals into output signals (col.2 lines 50-55) to be used in a variety of systems, including that of a robotic system (col.4 lines 64-67; col.6 lines 6-15).

Wang fails to teach wherein the machine readable graphic image is a digital watermark and wherein the determination of the orientation of said at least one of said parts relies upon data read from said digital watermark.

Rhoads describes the marking of items, either through an innocuous carrier (e.g. a photograph associated with the product), or by encoding the microtopology of the merchandise's surface or a label thereon for use in systems where the generally used

barcodes and universal product codes may be undesirable (col.94 lines 55-63). Rhoad's solution includes the use of watermarks embedded using image processing software such as Adobe (col.90 lines 54-66) comprising grid signals for orientation purposes as well as a plurality of other information to be used by a variety of systems (col.72 lines 43-59). Rhoads goes on to describe how many industries (e.g. automobile and airlines), stenographically mark industrial parts to provide inconspicuous identification and authentication tags instead of relying on paper tags that can easily be removed and counterfeited (col.95 lines 6-11).

Schaffer teaches a method for controlling placement of a first part on a second part using a vision alignment system to improve placement accuracy of the first part (electronic component) on the second part (PCB) including the necessary means to calculate possible deviations such as rotation and translation of said first part with respect to said second part (col.2 lines 45-49; col.6 lines 33-3).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include within Wang the digital watermarks as described in Rhoads to allow for an increase in the amount of data encoded onto and read from the label that can be quickly and easily decoded and used to control the rotation and translation of the first part onto the second part described within Schaffer to align parts properly.

As per **claim 7**, the combined system of Wang, Rhoads and Schaffer discloses the method of claim 6 including means for reading payload data from said watermark (see Wang col.6 lines 6-11).

As per **claim 8**, the combined system of Wang, Rhoads and Schaffer discloses the method of claim 6 wherein the orientation is used to determine a location of said at least one of said parts (see Schaffer col.2 lines 45-49; col.6 lines 33-3).

As per **claim 9**, the combined system of Wang, Rhoads and Schaffer discloses the system of claim 6 wherein the orientation is used to determine a distance of said at least one of said parts from said means for reading (see Schaffer col.6 lines 35-36).

As per **claims 10 and 11**, the combined system of Wang, Rhoads and Schaffer discloses the system as recited in claim 6 wherein said first part is an electronic component and wherein said second part is a printed circuit board (see Schaffer col.2 lines 45-49).

Claim 12 refers to a robot for handling items, said robot including a camera for acquiring an electronic image of a digital watermark, a computer including a program for reading a digital watermark in an electronic image acquired by said camera and a controller for controlling said robot in response to orientation data acquired from said digital watermark, said controller controlling positioning or movement of an item including the digital watermark

Wang refers to a system for encoding data in a machine-readable graphic image form having an increased capacity for encoded information (col.2 lines 3-7) which is

then transferred onto a data carrier means (e.g. the surface of a machine part) (col.2 lines 23-26). Wang's system further comprises recognition means (camera) for converting the image from the data carrier means into electrical signals representative of the graphic indicia and means for decoding the signals into output signals (col.2 lines 50-55) to be used in a variety of systems, including those controlling robotic systems (col.4 lines 64-67; col.6 lines 6-15).

Wang fails to teach wherein the machine-readable graphic image is a digital watermark and wherein the determination of the orientation of said at least one of said parts relies upon data read from said digital watermark.

Rhoads describes the use of image processing software such as Adobe (col.90 lines 54-66) in order to embed watermarks in for the purpose of marking of items, either through an innocuous carrier (e.g. a photograph associated with the product), or by encoding the microtopology of the merchandise's surface or a label thereon for use in systems where the more generally used barcodes and universal product codes may be undesirable (col.94 lines 55-63). Rhoads goes on to disclose a plurality of industries (e.g. automobile and airlines) and how they stenographically mark industrial parts to provide inconspicuous identification and authentication tags instead of relying on paper tags that can easily be removed and counterfeited (col.95 lines 6-11).

Schaffer teaches a method for controlling placement of a first part on a second part using a vision alignment system to improve placement accuracy of the first part (electronic component) on the second part (PCB) including the necessary means to

calculate possible deviations such as rotation and translation of said first part with respect to said second part (col.2 lines 45-49; col.6 lines 33-3).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include within Wang the digital watermarks as described in Rhoads to allow for an increase in the amount of data encoded onto and read from the label that can be quickly and easily decoded and used to control the rotation and translation of the first part onto the second part described within Schaffer to align parts properly.

As per **claim 13**, the combined system of Wang, Rhoads and Schaffer discloses the robot cited in claim 12 including means for reading a grid signal from said digital watermark (see Rhoads col.72 lines 43-59).

As per **claim 14**, the combined system of Wang, Rhoads and Schaffer discloses the robot cited in claim 13 wherein said printed image is on an item to be handled by said robot (see Wang col.2 lines 23-26).

As per **claim 15**, the combined system of Wang, Rhoads and Schaffer discloses the robot cited in claim 14 including means for determining a distance from said camera to the printed image from said grid signal (see Rhoads col.72 lines 43-59).

As per **claim 16**, the combined system of Wang, Rhoads and Schaffer discloses the robot cited in claim 14 including means for determining an orientation of the printed image from said grid signal (see Rhoads col.72 lines 43-59).

Claim 17 refers to a method for controlling placement of a first part on a second part wherein the first part includes stenographic encoding redundantly provided thereon, the stenographic encoding including an orientation component, said method comprising: receiving image data corresponding to at least a portion of the first part, the portion including at least one redundant instance of the stenographic encoding; reading the orientation component of the stenographic encoding; determining an orientation of the first part through reference to at least the orientation component of the stenographic encoding; controlling placement of the first part on the second part through reference to at least the determined orientation of the first part.

Wang refers to a method for encoding data in a machine-readable graphic image form having an increased capacity for encoded information (col.2 lines 3-7) which is then transferred onto a data carrier means (e.g. the surface of a machine part) (col.2 lines 23-26). Wang's system further comprises recognition means for converting the image into electrical signals representative of the graphic indicia and means for decoding the signals into a plurality of output signals (col.2 lines 50-55) to be used in a variety of systems, including that of a robotic system (col.4 lines 64-67; col.6 lines 6-15).

Wang fails to teach the placement of a first part on a second part wherein the first part contains a 'machine-readable graphic image' comprised stenographic encoding

redundantly provided thereon and wherein the orientation component contained therein is used to determine the orientation of the first part.

Rhoads describes the marking of items, either through an innocuous carrier (e.g. a photograph associated with the product), or by redundantly (col.91 lines 52-55) encoding the microtopology of the merchandise's surface or a label thereon for use in systems where the generally used barcodes and universal product codes may be undesirable (col.94 lines 55-63). Rhoads goes on to describe how many industries (e.g. automobile and airlines), stenographically mark industrial parts to provide inconspicuous identification and authentication tags instead of relying on paper tags that can easily be removed and counterfeited (col.95 lines 6-11).

Schaffer teaches a method for controlling placement of a first part on a second part using a vision alignment system to improve placement accuracy of the first part (electronic component) on the second part (PCB) including the necessary means to calculate possible deviations such as orientation, rotation and translation of said first part with respect to said second part (col.2 lines 45-49; col.6 lines 33-3).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include within Wang the digital watermarks as described in Rhoads to allow for an increase in the amount of data encoded onto the label that can be quickly and easily decoded and used to control the orientation, rotation and translation of the first part onto the second part described within Schaffer to align parts properly.

As per **claim 18**, the combined system of Wang, Rhoads and Schaffer discloses the method of claim 17, wherein the determined orientation of the first part comprises an angular rotation of the first part (see Schaffer col.2 lines 45-49; col.6 lines 33-3).

As per **claim 19**, the combined system of Wang, Rhoads and Schaffer discloses the method of claim 17, wherein the determined orientation of the first part comprises an relative distance of the first part (see Rhoads col.72 lines 43-59).

As per **claim 20**, the combined system of Wang, Rhoads and Schaffer discloses the method of claim 17, wherein the stenographic encoding further comprises an identifier to identify the part (see Rhoads col.95 lines 6-11).

As per **claim 27**, the combined system of Wang and Rhoads discloses the robot of claim 21, but fails to teach wherein the first part comprises an electronic component.

Schaffer teaches a system for controlling placement of a first part on a second part using a vision alignment system to improve placement accuracy of the first part (electronic component) on the second part (PCB) including the necessary means to calculate possible deviations such as rotation and translation of said first part with respect to said second part (col.2 lines 45-49; col.6 lines 33-3).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include within the combined system of Wang and Rhoads, wherein the

first part comprises an electronic component as taught in Schaffer to provide for the automated production of circuit boards.

As per **claim 28**, the combined system of Wang and Rhoads discloses the robot of claim 21, but fails to disclose wherein the robot handles items in a pick-and-place system and wherein at last one of the items comprises and electronic component.

Schaffer teaches a pick-and-place system for controlling placement of a first part on a second part using a vision alignment system to improve placement accuracy of the first part (electronic component) on the second part (PCB) including the necessary means to calculate possible deviations such as rotation and translation of said first part with respect to said second part (col.2 lines 45-49; col.6 lines 33-3).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include within the combined system of Wang and Rhoads, Schaffer's electronic component utilized within a pick-and-place system to provide for the automated production of circuit boards.

(10) Response to Argument

In response to the Applicant's remarks concerning the Examiner's 35 U.S.C. 103(a) rejection of claim 21, the Examiner would first like to refer back to the October 12, 2005 Advisory Action. In response to the Applicant's amendments to independent claim 21 and assertions that claims 1-28 were now in condition for allowance, the

Examiner respectfully disagreed noting that the combination of references relied upon taught each additional limitation. The changes made within the amendment to claim 21 were merely taken from other independent claims, and would be rejected for the same reasons in view of the same art.

The Applicant alleges that Wang, although concerned with carrying data, is silent with respect to orientation or position information associated with an encoded 2-D graphic. The Examiner agrees, and refers the Applicant back to page 12 of the Examiner's Final Office Action in which she specifically notes that Wang fails to teach wherein an orientation contained within the watermark is used to determine the orientation of a part. Although this passage was originally written to refer to claim 17, at the time it was written claim 17 included the orientation component in question while claim 21 did not. Taken in conjunction with the subsequent Advisory Action, it is reasonable to assume that the same art would be used to reject the abovementioned limitation in each of the independent claims reciting it.

Additionally, the Examiner refers to column 6, lines 6-14 of Wang wherein it is clearly recited that the encoded data may comprise control data in the form of machine operating instructions for controlling a robotic system. The Examiner would also like to make mention of lines 64-68, column 2 wherein Rhoads states "the present invention contemplates the outputting of the decoder output signals to a microprocessor for controlling the operation of various machines such as robotic systems." A scanner coupled to the machine tool is programmed to read the pattern printed on the device, in our case a watermark, and from that transmit the decoded instructions to the control

computer which in turn controls the machining of the part, or even the placement of patterns on street signs (col.6 lines 15-27). It is reasonable to assume that such information, relied upon to provide a machining system with the necessary machining instructions or placement instruction, might be relied upon to determine the orientation of parts and the likes.

The Applicant goes on to discuss Rhoads, and his failure to mention a robot to handle items and the determination of the orientation of an item and use of physical position information. Nowhere in the Examiner's previous office action is it ever suggested that Rhoads mentions a robot to handle items. Referring specifically to page 7 of the final Office Action, the Examiner states that the Rhoads patent is concerned with watermarking items, either through an innocuous carrier or by directly encoding the microtopology of the merchandise's surface or a label thereon for use in systems where the generally used barcodes and universal product codes are not enough. Rhoad's solution does include the use of watermarks embedded using image processing software such as Adobe (col.90 lines 54-66) comprising grid signals for orientation purposes as well as a plurality of other information to be used by a variety of systems (col.72 lines 43-59). Rhoads lists a few of these systems, including but not limited to automobile and airlines, wherein the stenographic marking of industrial parts provides inconspicuous identification and authentication tags that are both reliable and secure.

The Applicant argues that there is no reason to combine the two references, and even if there were a reason to combine, that those two references in combination would fail to fully disclose the Applicant's claimed invention. The Examiner respectfully

disagrees with the Applicant's arguments, providing additional clarification for the motivation statement appearing on page 7, lines 14-15 of the July 1, 2005 Final Office Action. Within that action, the Examiner suggests that one of ordinary skill in the art would be motivated to combine the teaching in the Rhoads patent with the teachings in the Wang patent to allow for an increase in the amount of data encoded onto the label; this is but one reason to combine the references. Since the publication of the Wang patent in 1992, watermarks have acquired widespread usage through a variety of fields. Systems relying upon the use of barcodes could now mark items with a watermark, either visible or invisible, in order to convey information in a more secure, organized, robust and reliable fashion. The Examiner has chosen to rely upon Rhoads for support with respect to watermarks because of the wealth of information the patent contains, including the benefits of watermarks over barcodes, and the use of watermarks in a variety of systems, including those that previously relied upon barcodes.

For those reasons presented in the previous office actions as well as those above, the Examiner maintains the previously presented 35 U.S.C. 103(a) rejection of independent claim 21, as well as claims 22-28 depending thereon, over Wang and in view of Rhoads.

As per the Applicant's arguments concerning claims 12-16, the Examiner respectfully disagrees. The Applicant's initial argument concerns Wang's alleged failure to discuss acquiring orientation data from machine-readable code, and also the controlling of the position or movement of an item. The Examiner would like to draw the

Applicant's attention once more to column 6 lines 6-14 of Wang wherein it is taught how machine data encoded onto carrier means may include control data in the form of machine operating instructions for the controlling of robotic systems. Wang goes on to discuss how the two-dimensional machine readable graphic containing the control data may be placed or printed directly onto a machine part or part holder and then how a scanner coupled to the machine could read the information from the pattern and transmit control instructions to a computer which in turn controls for example, the machining of a part in accordance with the control information. Within lines 64-69 of column 2, Wang discloses how the present invention contemplates the outputting of the decoder output signals to a microprocessor for controlling the operation of various machines, including but not limited to robotic systems. The Examiner has taken the control information above to include the information necessary to control the operating of robotic systems, including those that are involved with machining parts, and including the movement of parts within those robotic systems, and the placement of those parts in relation to other parts.

The Applicant goes on to discuss Rhoads' alleged failure to discuss controlling a robot to position or move and item including a digital watermark in response to orientation data acquired from the watermark. It should be noted that Rhoads has not been relied upon for the abovementioned, but rather for its disclosure of the marking of items, either through an innocuous carrier (e.g. a photograph associated with the product), or by encoding the microtopology of the merchandise's surface or a label thereon for use in systems where the generally used barcodes and universal product

codes may be undesirable (col.94 lines 55-63). Rhoads' solution does include the use of watermarks embedded using image processing software such as Adobe (col.90 lines 54-66) comprising grid signals for orientation purposes as well as a plurality of other information to be used by a variety of systems (col.72 lines 43-59). Rhoads goes on to describe how many industries (e.g. automobile and airlines), stenographically mark industrial parts to provide inconspicuous identification and authentication tags instead of relying on paper tags that can easily be removed and counterfeited (col.95 lines 6-11).

Although the Applicant fails to discuss Schaffer in regards to claim 12, the Applicant's addition of an orientation limitation within his after final amendments necessitated the new ground(s) of rejection presented above in view of Schaffer. Schaffer is relied upon to teach a method for controlling placement of a first part on a second part using a vision alignment system to improve placement accuracy of the first part on a second part including the necessary means to calculate possible deviations such as rotation and translation of said first part with respect to said second part (col.2 lines 45-49; col.6 lines 33-3).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include within Wang the digital watermarks as described in Rhoads to allow for an increase in the amount of data encoded onto and read from the label that can be quickly, reliably, and securely decoded and used to control the rotation and translation of the first part onto the second part described within Schaffer to align parts properly.

The Examiner respectfully disagrees with the Applicant's arguments concerning claims 1-5. The Applicant's initial argument concerns Wang's failure to recite a grid signal. The Examiner would like to draw the Applicant's attention once more to column 6 lines 6-14 of Wang wherein it is taught how machine data encoded onto carrier means may include control data in the form of machine operating instructions for the controlling of robotic systems. Wang goes on to discuss how the two-dimensional machine readable graphic containing the control data may be placed or printed directly onto a

machine part or part holder and then how a scanner coupled to the machine could read the information from the pattern and transmit control instructions to a computer which in turn controls for example, the machining of a part in accordance with the control information. Within lines 64-69 of column 2, Wang discloses how the present invention contemplates the outputting of the decoder output signals to a microprocessor for controlling the operation of various machines, including but not limited to robotic systems. The Examiner has taken the control information above to include the grid signal information necessary to control the operating of robotic systems, including those that are involved with machining parts, and including the movement of parts within those robotic systems, and the placement of those parts in relation to other parts.

Additionally, the Examiner would like to note that it is Rhoads that is relied upon most heavily for its teaching of grid signals used for orientation purposes and disclosed in lines 43-5p of column 72. Although Rhoads discloses the use of these watermarks for a variety of purposes, it is Schaffer that is relied upon for its use of orientation signals for the purpose of placing parts based on a method for controlling placement of a first part on a second part using a vision alignment system to improve placement accuracy of the first part on a second part including the necessary means to calculate possible deviations such as rotation and translation of said first part with respect to said second part (col.2 lines 45-49; col.6 lines 33-3). Although it is true that Schaffer does not specifically disclose the use of watermarks, as shown above, since the publication of the Wang patent in 1992 and the Schaffer patent originally files in 1996, watermarks have acquired widespread usage through a variety of fields. Systems relying upon the

use of barcodes could now mark items with a watermark, either visible or invisible, in order to convey information in a more secure, organized, robust and reliable fashion. The Examiner has chosen to rely upon Rhoads for support with respect to watermarks because of the wealth of information the patent contains, including the benefits of watermarks over barcodes, and the use of watermarks in a variety of systems, including those that previously relied upon barcodes such as the systems of Wang and Schaffer.

The Applicant once again argues the combination of Wang, Schaffer and Rhoads and is directed to those arguments presented above in response.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include within Wang the digital watermarks as described in Rhoads to allow for an increase in the amount of data encoded onto and read from the label that can be quickly, reliably, and securely decoded and used to control the rotation and translation of the first part onto the second part described within Schaffer to align parts quickly and accurately.

The Examiner respectfully disagrees with the Applicant's arguments concerning claims 17-20. The Applicant's initial argument concerns Wang's failure to teach or suggest a method to control placement of a first part on a second part or that the first party includes stenographic encoding redundantly provided thereon, with the stenographic encoding including an orientation component. Looking closely at the Final Office Action of July 1, 2005, it is noted that Wang does in fact fail to teach the placement of a first part on a second part wherein the first part contains a 'machine-

readable graphic image' comprised stenographic encoding redundantly provided thereon and wherein the orientation component contained therein is used to determine the orientation of the first part. It is also stated, that it is not Wang that is relied upon for the abovementioned components, but rather Schaffer and Rhoads.

Schaffer clearly teaches a method for controlling placement of a first part on a second part using a vision alignment system to improve placement accuracy of the first part (electronic component) on the second part (PCB) including the necessary means to calculate possible deviations such as orientation, rotation and translation of said first part with respect to said second part (col.2 lines 45-49; col.6 lines 33-3). Meanwhile, Rhoads is relied upon to describe the marking of items, either through an innocuous carrier (e.g. a photograph associated with the product), or by *redundantly* (col.91 lines 52-55) encoding the microtopology of the merchandise's surface or a label thereon for use in systems where the generally used barcodes and universal product codes may be undesirable (col.94 lines 55-63). Rhoads goes on to describe how many industries (e.g. automobile and airlines), stenographically mark industrial parts to provide inconspicuous identification and authentication tags instead of relying on paper tags that can easily be removed and counterfeited (col.95 lines 6-11). From these teachings, it is made apparent that the invisible watermarks of Rhoads would provide the necessary measurements to mark items discretely, making it more difficult if not impossible for individuals to remove or alter those markings.

Concerning the Applicant's next set of arguments concerning a reason to combine, it is the Examiner's opinion that it would have been obvious to a person of

ordinary skill in the art at the time of the invention to include within Wang the digital watermarks as described in Rhoads to allow for an increase in the amount of data encoded onto and read from the label that can be quickly, reliably, and securely decoded and used to control the rotation and translation of the first part onto the second part described within Schaffer to align parts quickly and accurately. Those above-mentioned sections of Rhoads provide ample support for the use of watermarks, invisible or visible, in those systems presently relying upon barcodes. The pick and place system of Schaffer would benefit by replacing its barcodes with the invisible watermarks taught by Rhoads in order to making it more difficult if not impossible for individuals to remove or alter those markings relied upon to place the parts upon one another and provide additional reliability to the entire system.

The Examiner respectfully disagrees with the Applicant's arguments concerning claims 6-11 for the same reasons as presented above in regards to independent claim 1 and its dependent claims.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

This examiner's answer contains a new ground of rejection set forth in section **(9)** above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer

exercise one of the following two options to avoid *sua sponte* **dismissal of the appeal** as to the claims subject to the new ground of rejection:

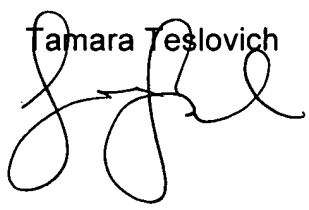
(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant to the new grounds of rejection. A request that complies with 37 CFR 41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.

(2) **Maintain appeal.** Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

Respectfully submitted,

Tamara Teslovich



A Technology Center Director or designee must personally approve the new ground(s) of rejection set forth in section (9) above by signing below:

James Dwyer

TC 2100 Director

Conferees: KVu

for Gilberto Baron

Matthew Smithers